

STUDY OF THE *AGERATINA MAIRETIANA* COMPLEX (ASTERACEAE-EUPATORIAE)

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McVaugh (1972) rendered a conspectus of a group of species centering about *Ageratina mairetiana*, which I will refer to here as the *A. mairetiana* complex. The group is readily recognized by its often small-tree habit, relatively thick, trullate or broadly ovate leaves and large heads, but most of all, by its 2-seriate pappus, the outer series consisting of very short (1-2 mm long), narrow, ciliate scales or bristles, the inner series of bristles 5-7 mm long. In addition, the achene is relatively elongate and is, to some degree, viscid - glabrous or glandular-pubescent (rarely intermixed with hispid hairs).

In spite of its distinctive nature the taxa concerned clearly belong to the genus *Ageratina*, subgenus *Neogreenella*, as defined by King and Robinson (1970, etc.), possessing a base chromosome number of $x=17$ and tubular, glabrous, corollas.

McVaugh (1972) recognized five species in the complex, one of these possessing two forms. He provided a key to the taxa concerned which has proven very helpful in my taxonomic evaluation of the group. I recognize seven species, including all of those recognized by McVaugh. One of these, *A. pringlei*, was not treated by McVaugh and the other, *A. yecorana*, is described as new in the present treatment. In addition I have elevated his forma of *A. mairetiana* to varietal status. The species are all closely related and occasional hybrids presumably occur between these where they occur together.

The common, widespread species, *A. glabrata* H.B.K., superficially resembles members of the complex, but can be immediately recognized by its 1-seriate pappus and merely hispid achenes.

The most obviously related species to the complex is *A. cremastra* (B. Rob.) King & H. Rob. of Guerrero. It has most of the features of the species, including leaf shape and nervation, involucre features and 2-seriate pappus. Its strictly axillary, lax, flexuous corymbs appear to set it apart from the other taxa, but on phyletic grounds it should be included. Yet more remote, but still closely related, is *A. oaxacana* (Klatt) King & H. Rob. (= *A. breedlovei* King & H. Rob.), which has quite different, pinnately-nerved, leaves, yet it also has the double pappus and the distinctive involucre of the *A. mairetiana* complex. From *A. oaxacana* one must slip into *A. pelotropa* (B. Rob.) King & H. Rob. (= *A. cronquistii* King & H. Rob.). Beyond the latter one might suggest a link with *Eupatorium areolare* DC., which King & Robinson treat as

a member of the genus Piptothrix which Gage (1986) would transfer to Ageratina. But these are problems for the future. My present intent is to provide a more comprehensive treatment of the A. mairetiana complex than is accorded the group by McVaugh, this having been occasioned by my attempts to identify material referred to here as A. yecorana. To this purpose I provide a key to the taxa concerned, as follows:

1. Peduncles and phyllaries densely stipitate-glandular.
 2. Pubescence of foliage a dense tomentum of brownish hairs up to 2 mm long; leaf-blades broadest at or near the middle-----A. chiapensis
 2. Pubescence of foliage not as above; leaf-blades broadest at or near the base-----A. pringlei
1. Peduncles and phyllaries variously pubescent to glabrous, but not densely stipitate-glandular (i.e., plants with only a smidgen of such hairs will key here).
3. Involucres 5-6(7) mm long.
 4. Capitulescence a large ovoid or subcylindric, paniculate thyrse formed by both terminal and axillary corymbs; heads usually pink or purplish-----A. cylindrica
 4. Capitulescence a simple rounded, terminal corymbose panicle; heads white-----A. cerifera
3. Involucres (7)8-12 mm long.
 5. Flowers (30)45-70 per head; achenes with stipitate-glandular hairs or with hispid hairs intermixed.
 6. Involucral bracts ca 1/2 - 2/3 as long as the heads, the middle series elliptical, 2-4 mm wide-----A. yecorana
 6. Involucral bracts as long as the heads, the middle series linear-lanceolate, 1-2 mm wide-----A. lasioneura
 5. Flowers (10)15-35 per head; achenes either viscid-glabrous or with atomiferous unstalked glands (rarely a few hispid hairs)-----A. mairetiana.
 7. Ultimate peduncles and young involucres glabrous or glutinous; florets 25-35 per head; branchlets usually reddish; Jalisco & Durango, (intergrades with the below)-----var elucens
 7. Ultimate peduncles and young involucres thinly to densely

tomentulose; florets 10-25 per head; branchlets whitened by the tomentum; widespread-----var maireriana

AGERATINA CERIFERA (McVaugh), King & H. Rob., Phytologia 24:86. 1972.

Eupatorium ceriferum McVaugh, Contr. Univ. Michigan Herb. 9:390. 1972. TYPE: MEXICO. JALISCO: Sierra de Cuale, SW of Talpa, 19-21 Nov 1952, McVaugh 14392 (holotype MICH; isotype US!)

McVaugh (1984) has rendered a detailed description based upon 3 collections, including the type, all from Jalisco. I have examined an additional collection from Guerrero (Dist. Mina, Laguna, 1900 m, 29 Nov 1936, Hinton 9919, GH, US).

The species is readily recognized by its small involucre (mostly 5-6 mm long), heads in terminal congested corymbs and achenes copiously covered with white waxy globules.

AGERATINA CHIAPENSIS (B. L. Rob.) King & H. Rob., Phytologia 19: 213. 1970.

Eupatorium chiapensis B. L. Rob., Proc. Amer. Acad. Arts 25:332. 1900. TYPE: MEXICO. CHIAPAS: ca Pinabete, 8 Feb 1896, E. W. Nelson 3786 (lectotype US!, as selected by McVaugh).

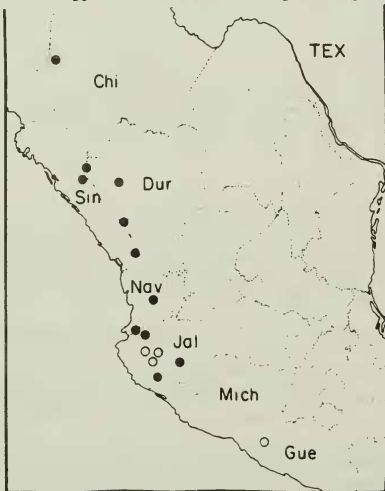


Fig. 1. Distribution of *A. cerifera* (O) and *A. lasioneura* (●).

McVaugh (1984) has rendered an excellent description of the taxon. As indicated in Fig. 4, the species is uncommon but widespread in southern Mexico, extending into adjacent Guatemala.

AGERATINA CYLINDRICA (McVaugh) King & H. Rob., Phytologia 24:89. 1972.

Eupatorium cylindricum McVaugh, Contr. Univ. Michigan Herb. 9: 393. 1972. (holotype MICH; isotype LL!, US!).

McVaugh (1984) has rendered a detailed description based upon collections from Jalisco and a single sheet from Mexico State. In addition, I have examined collections as shown in Fig 2, including material from the following, previously unreported states: MICHOACAN: 10 km NW Quiroga, 20 May 1978, Nunez & Ramos 698 (WISC);



Fig. 2. Distribution of *Ageratina cylindrica* (●), *A. pringlei* (*), *A. yecorana* (○).

ca Morelia, Mar 1909, Arsene 2449 (GN, NY, UC, US). MORELOS: 19.2 mi NW of Cuautla, 3 Mar 1985, Luckow 2508 (TEX). GUERRERO: Taxco, 15 Feb 1936, Abbott 91, 93, 94 (GH).

As noted by McVaugh in his original description of the species, *A. cylindrica* is readily recognized by its very large capitulescence and relatively small heads (5-6 mm high) which superficially resemble those of *A. cerifera*.

AGERATINA LASIONEURA (Hook. & Arn.). King & H. Rob., *Phytologia* 19:224. 1970.

Eupatorium lasioneuron Hook. & Arn., Bot. Beechey Voy. 297. 1840. TYPE: MEXICO. JALISCO: w/o date, w/o locality, Beechey s.n. (holotype K; holotype tracing, GH!).

Eupatorium chapalense S. Wats., Proc. Amer. Acad. Arts 26: 138. 1891. TYPE: MEXICO. JALISCO: mountains near Lake Chapala, 17 Dec 1889, Pringle 2974 (holotype GH!).

Eupatorium chapalense S. Wats. var. *salicifolium* B. Rob., Proc. Amer. Acad. Arts 35: 332. 1900. TYPE: MEXICO. JALISCO: mountains near Lake Chapala, 18 Oct 1895, Pringle 7071 (holotype GH!).

Ageratina chapalensis (S. Wats.) King & H. Rob. 19:220. 1970.

McVaugh (1984) has described this species in some detail and my understanding of the taxon is essentially the same as his, except that I sink *A. chapalensis* into synonymy without hesitation. *Ageratina lasioneura* can be distinguished from *A. maireriana* by its achenes which are variously pubescent with hispid hairs or stalked glands; those of *A. maireriana* are invariably glabrous or beset with sessile atomiferous viscid globules.

The single collection from Chihuahua as shown in Fig 1 ("Lagotera", 21 Jul 1965, Pennington 89, TEX), definitely belongs to the *A. maireriana* complex, possessing the distinctive double pappus and associated features. It differs from *A. lasioneura* in having the achenes hispid only, but the specimen is well-past maturity and the glands may have shed.

AGERATINA MAIRETIANA (DC.) King & H. Rob., *Phytologia* 19:224. 1970.

Eupatorium mairerianum DC., Prod. 5: 167. 1836. TYPE: MEXICO. MEXICO STATE: w/o locality, 1833, Mairet s.n. (holotype G-DC; microfiche G-DC!)

Eupatorium cognatum Kunth & Bouche, Ind. Sem. Hort, Berol. 1847: 13. 1847. (according to B. Robinson, 1961).

Eupatorium rafaelense Coulter, Bot. Gaz. 16: 97. 1891. TYPE:

GUATEMALA. ZACATEPEQUEZ: San Rafael, 6500 ft, Apr 1890, J.D. Smith 2368 (lectotype F; isolectotype GH,US!).

Ageratina rafaensis (Coulter) King & H. Rob., *Phytologia* 19:225. 1970.

McVaugh (1984) has given an accurate and thorough description of this species. In addition he (1972) rendered a workable key to related taxa, pointing out most of the salient features which mark them. He acknowledges difficulty in separating A. lasioneura from A. mairetiana, but I find these two species to be readily distinguishable, largely by their achenes, as noted in my key to species (above). As indicated by McVaugh (1972), A. lasioneura occasionally has a few very short glandular-trichomes on its peduncles, these intermixed with an arachnoid-tomentose pubescence. Such glands are rarely, if at all, found in A. mairetiana. However, B. Robinson described a var. adenopodium of Eupatorium mairetianum from Guatemala, which was accepted as a synonym of the latter by Williams (1976). Examination of the type of var. adenopodium has convinced me that it is a synonym of A. pringlei.

As shown in Fig. 3, Ageratina mairetiana is a widespread variable species comprising two varieties which intergrade in southern Jalisco, Michoacan and adjacent Mexico State. Thus the var. elucens (below) is quite variable in the latter region; but the populations in Durango and adjacent Sinaloa are quite uniform. Similarly, the var. mairetiana is fairly uniform throughout most of



Fig. 3. Distribution of Ageratina mairetiana.

its range except in Michoacan and adjacent areas where intergrades occur.

As noted below, occasional putative hybrids between *A. mairetiana* and *A. pringlei* occur in the Cerro de San Felipe of Oaxaca where the two taxa are in close proximity. Occasional hybrids between these two taxa presumably also occur in Guatemala and these are discussed under *A. pringlei*.

In Oaxaca, *A. mairetiana* is more commonly encountered than is *A. pringlei*, at least 10 different collections having been made of the former by a number of workers (NY, TEX, US), mostly about the city of Oaxaca and along highway 175 toward Ixtlan de Juarez between 2400 and 2700 m. *Ageratina pringlei*, as noted under the discussion of this species, is known only by a few collections from Cerro San Felipe at about the same elevations. Regardless, *A. pringlei* is readily recognized by its smaller, more deltoid leaves and glandular-pubescent capitulescence (including involucre bracts).

AGERATINA MAIRETIANA var. *ELUCENS* (McVaugh) B. Turner, comb. nov.

Eupatorium mairetianum f. *elucens* McVaugh, Contr. Univ. Michigan Herb. 9:400. 1972. (holotype MICH; isotype LL!)

Eupatorium multiserratum Sch.-Bip. in Seem., Bot. Voy. Herald 301, 1856. TYPE: MEXICO. SINALOA, DURANGO or NAYARIT: w/o locality, 1850, Seaman 1987 (P).

Ageratina multiserrata (Sch-Bip.) King & H. Rob., Phytologia 24:94. 1972.

McVaugh (1984) has rendered a detailed description of this taxon, which he designated a "forma". In my opinion the variation concerned more rightly applies to what most present-day systematist would call a variety : i.e., the characters which mark the taxon are relatively consistent over a broad region but appear to intergrade

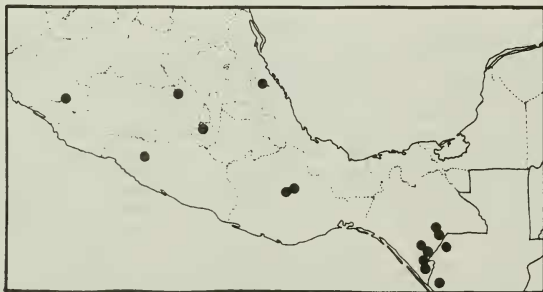


Fig. 4. Distribution of *A. chiapensis* (●).

peripherally with its adjacent regionally marked sister-taxon, var. mairetiana. So far as known, the variety in its "typical form" is confined to the states of Sinaloa, Durango and Jalisco (Fig. 3). The variety is readily distinguished by its elongate, narrow, glabrous or viscid involucre bracts, the outer members of which form a partial calyculum. The typical var mairetiana is more widespread and, as noted by McVaugh, is distinguished by its usually tomentulose head with fewer florets.

I place Eupatorium multiserratum in synonymy here, instead of with Ageratina lasioneura since its original describer, as well as McVaugh (1984), who examined the type, notes the achenes (albeit immature) to be glabrous. This character, along with the glabrescent involucre bracts, suggest that the plant belongs to A. mairetiana var elucens; certainly Seemann collected in the same region where the latter is known to occur (the Sinaloa-Durango border region WSW of Durango City.).

AGERATINA PRINGLEI (B. L. Rob. & Greenm.) King & H. Rob, *Phytologia* 19:225. 1970.

Eupatorium pringlei B. L. Rob. & Greenm., *Amer. J. Sci.* 50:152. 1895. TYPE: MEXICO. OAXACA: Sierra de San Felipe, 9500 ft, 24 Dec 1894, C. G. Pringle 6118 (holotype GH!; isotype A!).

Eupatorium mairetianum var. adenopodium B. L. Rob., *Proc. Amer. Acad. Arts* 51:534. 1916. TYPE: GUATEMALA. QUEZALTENANGO: Cerro Quemado, 21 Jan 1915, Holway 98 (holotype GH!).

This species was not included with the Ageratina mairetiana complex by McVaugh (1972). It clearly belongs to this group, however, possessing a dimorphic pappus, the outer series a group of short slender bristles. In addition, the foliage and achenes are like that species. Indeed Robinson, as noted above, described plants of this species from Guatemala as a variety of A. mairetiana.

Williams (1976) did not account for this species in his treatment of Eupatorium for the Flora of Guatemala. Apparently he included within his concept of E. mairetianum material which I would treat as E. pringlei. He takes the var. adenopodium to be a form of E. mairetianum in which the peduncles are densely glandular-puberulent (as opposed to tomentulose), and further alludes to the considerable "variation and integradation" in such characters. Actually, I find the glandular trichomes to be a valid marker of E. pringlei. It is probable that occasional hybridization produces the occasional intermediate (e.g., Dept. of Totonicapan, near Polagua, Williams et al. 22651, NY; etc). Future field workers should look into this problem, for as it now stands, the following treatments are possible: 1) acceptance of two species as treated here, 2) acceptance of a regional variety adenopodium with intergrades or 3) a single, highly variable, species with both tomentulose and glandular-pubescent peduncles. I think the first option to be the

best treatment based on present knowledge.

The type collection of *A. pringlei* is well endowed with glandular trichomes in the capitulescence, but the only two other collections known to me from Oaxaca are rather sparsely glandular. One of these (5 km N of hwy 175 at km post 20, E of Oaxaca, on logging road, Cerro San Felipe, 8600 ft, 14 Jan 1972, Spellenberg 2788, NY) is fairly typical *A. pringlei* but tends toward *A. maireriana*, while the other (Mcpio. Ixtepeji, ca 30 km S of the turn off to Ixtlan de Juarez on hwy 175, 2500 m, 2 Feb 1981, Martin 295, NY) is more or less intermediate between these taxa. It is possible that the two taxa hybridize in this area.

AGERATINA YECORANA B. Turner, sp. nov., Fig. 5.

A. lasioneuræ simile sed foliis 3(5)-nervibus ad basim et bracteis involucri valde imbricatis ellipticis vel oblongis flosculis enclisis multo brevioribus differt.

Erect shrub 1-2 m high. Stems at first white-tomentulose but with age glabrate and tan. Leaves opposite, 4-15 cm long, 3-9 cm wide; petioles 2-4 cm long; blades ovate to deltoid or rarely subcordate, 3(5)-nervate from the base, at first white-tomentulose above and below, with age puberulent or glabrate, the margins crenulate. Heads white, 10-25 in a terminal rounded corymb, 2-3 times as wide as high, similar but smaller corymbs also developing in the lower leaf axils immediately below. Involucres campanulate (8)10-12 mm high, 10-14 mm wide, 3-4 seriate, graduate; middle bracts decidedly elliptical or oblong 4.5-8.5 mm long, 2-4 mm wide, tomentulose. Receptacle convex, ca 3 mm across. Florets 45-55; corollas 7-9 mm long, tubular, glabrous except for a few hairs on the lobes. Achene both hispid and glandular-pubescent, ca 3 mm long; pappus double, an outer series of narrow ciliate scales ca 1 mm long and an inner series of 20-25 fragile ciliate bristles 6-8 mm long.

TYPE: MEXICO. SONORA: "Along the dirt road from Santa Rosa to Yecora, 8 mi E of Santa Rosa, about 10 mi W of Yecora" (ca 109° 02' W X 28° 28'N), along a small stream, bordering dry rocky volcanic slopes with *Quercus*, *Pinus* and *Lysiloma*; ca 5000 ft, 8 Apr 1982, A. C. Sanders, K. Kirtland & D. Emery 2643 (holotype TEX; isotype UC).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. CHIHUAHUA: Arroyo Hondo, Sierra Charuco, 4500-5500 ft, 16-30 Apr 1948, Gentry 8062 (UC, US). SONORA: 11.1 mi (by road) W of Yecora (28° 03'N x 109° 01' W), 1575 m, moist seep along side of road, 2 May 1975, Carter et al. 75-55 (UC,US); Canyon de Tejas, Sierra Charuco, 4000-5000, 24 Apr 1948, Gentry 8124 (UC,US).

Strother (by annotation) identified type material of this species as *Eupatorium chapalense*, which is a synonym of *E. lasioneuron*. *Ageratina yecorana* differs markedly from the latter in

its large heads with elliptical or oblong-elliptical, markedly graduate, involucral bracts. The species is apparently a local endemic in the region about Yecora, Sonora (Fig. 2).

ACKNOWLEDGEMENTS

This study is based upon about 400 collections from the following herbaria: GH(110), LL(50), NY(75), TEX(125), UC(40). I am grateful to the institutions concerned for the loan of materials. Guy Nesom provided the Latin diagnosis and Linda Vorobik illustrated A. yecorana.

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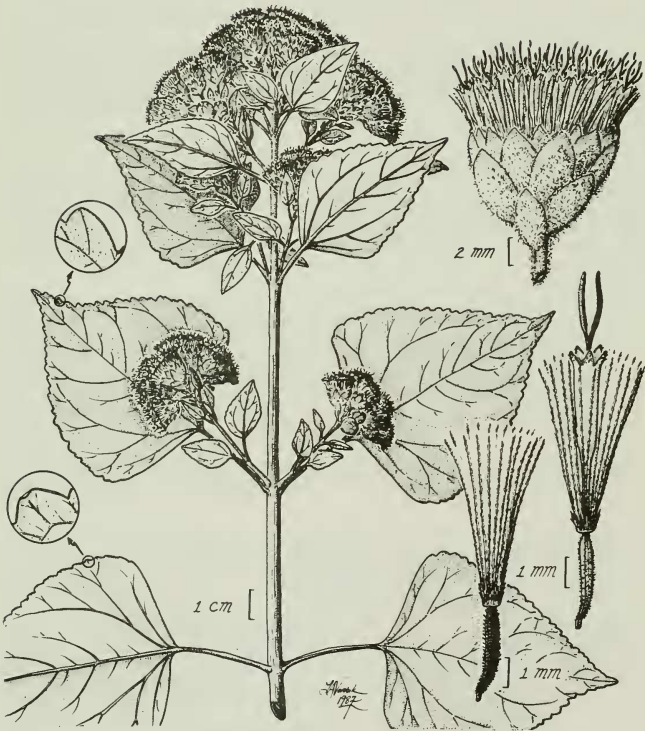


Fig. 5. *Ageratina yecorana*, from holotype.